

WHAT IS CLAIMED IS:

1. A polyester fiber having a hygroscopic parameter ΔMR of 1% or more containing 1 to 20 percent by weight of silica-based inorganic particles, wherein the silica-based inorganic particles satisfy the following conditions (A) to (C):

(A) the micropore volume is 0.4 ml/g or more, and the following relationship is satisfied:

$$100 \leq S/V < 1,500$$

wherein S means the specific surface area S (m^2/g) of the inorganic particles;

(B) the average particle diameter D is in the range of 0.01 to 10 μm ; and

(C) the hygroscopic parameter ΔMR is 7% or more.

2. A polyester fiber according to claim 1, wherein the diethylene glycol content in the polyester constituting the polyester fiber is 2 percent by weight or less, and the carboxyl end group content in the polyester is in the range of 10 to 50 equivalent/ton.

3. A polyester fiber according to claim 1, wherein the amount of the polyester adhering to the silica-based inorganic particles in the polyester fiber is 0.3 g or less

per one gram of silica-based inorganic particles.

4. A polyester fiber according to claim 1, wherein the fiber is moist heat treated.

5. A polyester fiber according to claim 1, wherein the content of particles of 4 μm or more in the silica-based inorganic particles is 5% or less.

6. A polyester fiber according to claim 1, wherein the silica-based inorganic particles are prepared by a wet process.

7. A polyester fiber according to claim 1, wherein the fiber is a conjugated fiber.

8. A polyester fiber according to claim 7, wherein the conjugated fiber is a core-sheath bicomponent fiber.

9. A polyester fiber according to claim 1, wherein the ratio d_{90}/d_{10} representing the particle size distribution of the silica-based inorganic particles is 2.0 or less.

10. A polyester fiber according to claim 1, wherein the aspect ratio of the silica-based inorganic particles is

20030817 014402

in the range of 1.0 to 1.5.

11. A polyester fiber according to claim 1 used for clothes.

12. A polyester fiber according to claim 1, wherein 80% or more of the polyester constituting the polyester fiber comprises alkylene terephthalate repeating units.

13. A polyester fiber according to claim 1, further comprising second particles other than the silica-based inorganic particles.

14. A polyester fiber according to claim 13, wherein the second particles are basic particles.

15. A polyester fiber according to claim 14, wherein the basic particles comprise at least one selected from the group consisting of zirconia, barium sulfate, calcium carbonate, and spinel.

16. A polyester fiber according to claim 1, wherein the silica-based inorganic particles are treated with at least one selected from the group consisting of aluminum compounds, compounds of transition metals belonging to the

10030847 044452

fourth period in the periodic table, lithium compounds, sodium compounds, potassium compounds, magnesium compounds, calcium compounds, barium compounds, boron compounds, phosphorus compounds, and silane coupling agents.

17. A polyester fiber according to claim 16, wherein the silica-based inorganic particles are treated with one of the aluminum compounds.

18. A polyester fiber according to claim 16, wherein the compound of transition metals belonging to the fourth period in the periodic table is at least one selected from Mn compounds, Co compounds, and Fe compounds.

19. A polyester fiber according to claim 16, wherein the phosphoric compound is at least one selected from phosphoric acid, phosphorous acid, and a phenylphosphonic acid derivative.

20. A polyester fiber according to claim 16, wherein the silane coupling agent is at least one selected from hexamethyldisilazane and dimethyldimethoxysilane.

21. A polyester fiber according to claim 1, wherein the antimony content in the polyester fiber is in the range

of 10 to 200 ppm.

22. A method for making a polyester composition comprising adding silica-based inorganic particles and other particles in any step for making a polyester for the polyester composition.

23. A method for making a polyester composition according to claim 22, wherein the other particles are basic particles.

24. A method for making a polyester composition comprising adding silica-based inorganic particles which are treated with at least one compound selected from the group consisting of aluminum compounds, compounds of transition metals belonging to the fourth period in the periodic table, lithium compounds, sodium compounds, potassium compounds, magnesium compounds, calcium compounds, barium compounds, boron compounds, phosphorus compounds, and silane coupling agents in any step for making a polyester for the polyester composition.

25. A method for making a polyester composition according to either claim 22 or 24, wherein the silica-based inorganic particles are added in a polymerization step of

the polyester.

26. A method for making a polyester composition according to claim 24, wherein the silica-based inorganic particles satisfy the following conditions (A) to (C):

(A) the micropore volume is 0.4 ml/g or more, and the following relationship is satisfied:

$$100 \leq S/V < 1,500$$

wherein S means the specific surface area S (m²/g) of the inorganic particles;

(B) the average particle diameter D is in the range of 0.01 to 10 μm; and

(C) the hygroscopic parameter ΔMR is 7% or more.